Energy Department Announces $13 Million to Advance Fuel Cell Performance and Durability and Hydrogen Storage Technologies

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Today, the Energy Department (DOE) announced more than $13 million in funding for the advancement of hydrogen and fuel cell technologies. These selected projects will leverage industry, university and laboratory expertise to accelerate American innovation in advanced hydrogen storage and fuel cell performance and durability.

In 2016, the Office of Energy Efficiency and Renewable Energy established two collaborative research consortia, each comprising a core team of DOE national laboratories, with plans to add industry and university partners. Led by Los Alamos National Laboratory, the Fuel Cell Consortium for Performance and Durability (FC-PAD) focuses on improving fuel cell performance and durability. Projects selected through this consortium will work to decrease the amount of platinum required and increase the performance and durability of transportation fuel cells, thereby decreasing cost and improving the life of fuel cell electric vehicles. The selected projects under this consortium are:

- 3M Company; St. Paul, Minnesota – the project will focus on integrating novel electrode ionomers with nanostructured thin film low-platinum group metal electrocatalysts in powder form to develop an improved cathode-coated membrane and electrode structure in the fuel cell.
- UTRC; East Hartford, Connecticut – the project will develop more durable cell electrodes to lower the cost and improve the performance of polymer electrolyte membrane fuel cells.
- Vanderbilt University; Nashville, Tennessee – this project is testing a new technique to electrospin low-platinum group metal electrocatalysts with a proton-conducting binder to improve durability and performance of fuel cell electrodes.
- General Motors; Pontiac, Michigan – this project will employ both experimental and modeling approaches to study the effect of operating conditions on degradation, as well as the ways membranes fail, to improve overall performance of low-platinum group metal electrodes.

The Hydrogen Materials—Advanced Research Consortium (HyMARC) is the newest consortium within DOE's Energy Materials Network, a national lab-led initiative that is leveraging $40 million in federal funding to tackle one of the major barriers to widespread commercialization of clean energy technologies: the design, testing, and production of advanced materials. By strengthening and facilitating industry access to the unique scientific and technical advanced materials innovation resources available at DOE's national labs, the network will help bring these materials to market more quickly. HyMARC's core team is

comprised of Sandia National Laboratories, Lawrence Livermore National Laboratory, and Lawrence Berkeley National Laboratory.

The projects selected under this consortium will work to improve onboard automotive hydrogen storage systems by lowering the cost and increasing the storage capacity to enable hydrogen infrastructure. The resulting fundamental understanding, when combined with materials data, will embody the approach described in the Materials Genome Initiative Strategic Plan for accelerated materials development. The selected projects are:

- Argonne National Laboratory; Argonne, Illinois – the project will develop a new class of hydrogen storage materials composed of nanoparticles of complex metal hydrides wrapped in sheets of graphene for improved onboard hydrogen storage.
- Pennsylvania State University; University Park, Pennsylvania – this project will investigate the synthesis of high-surface area boron-doped polymeric sorbent materials for hydrogen storage, with improved performance for onboard hydrogen storage.
- University of Hawaii, Manoa; Honolulu, Hawaii – this project will investigate magnesium boride etherates as reversible hydrogen storage materials with properties that are vastly improved over un-solvated magnesium boride.
- University of Missouri, St. Louis; St. Louis, Missouri – this project will use a novel approach to stabilize unstable metal hydrides with sufficient storage capacities, and render reversible stable high capacity hydrides that are irreversible in the bulk, resulting in a high-capacity material with kinetics suitable for onboard hydrogen storage.

The Department's Office of Energy Efficiency and Renewable Energy (EERE) accelerates development and deployment of energy efficiency and renewable energy technologies and market-based solutions that strengthen U.S. energy security, environmental quality, and economic vitality. Learn more about the Energy Department's broader efforts to develop affordable, efficient fuel cell and hydrogen technologies on EERE's Hydrogen and Fuel Cells page.

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